

## CHECKLIST TO DESIGNATE AREAS OF EVALUATION FOR REQUESTS FOR PROPOSAL (RFP)

|  |   |  |  |                      |
|--|---|--|--|----------------------|
| MDOT PROJECT MANAGER<br>Daniel Belcher   |   |  | JOB NUMBER (JN)  | CONTROL SECTION (CS) |
| DESCRIPTION IF NO JN/CS<br>Machine Assisted Construction of Highways 1 (Mach1)   |   |  |  |                      |
| <b>MDOT PROJECT MANAGER:</b> Check all items to be included in RFP.<br><br>WHITE = REQUIRED<br>GRAY SHADING = OPTIONAL |   |  | <b>CONSULTANT:</b> Provide only checked items below in proposal.   |                      |
| Check the appropriate Tier in the box below  |   |  |  |                      |
| <input type="checkbox"/><br><b>TIER I</b><br>(\$25,000-\$99,999)   | <input type="checkbox"/><br><b>TIER II</b><br>(\$100,000-\$250,000) | <input checked="" type="checkbox"/><br><b>TIER III</b><br>(>\$250,000) |  |                      |
| <input type="checkbox"/>   | <input type="checkbox"/>  | <input checked="" type="checkbox"/>                                    | Understanding of Service   |                      |
| <input type="checkbox"/>   | <input type="checkbox"/>  | <input type="checkbox"/>   | <i>Innovations</i>   |                      |
| <input type="checkbox"/>   | <input type="checkbox"/>  | <input type="checkbox"/>   | <i>Safety Program</i>  |                      |
| N/A  | <input type="checkbox"/>  | <input type="checkbox"/>   | Organization Chart   |                      |
| <input type="checkbox"/>   | <input type="checkbox"/>  | <input checked="" type="checkbox"/>                                    | Qualifications of Team   |                      |
| <input type="checkbox"/>   | <input type="checkbox"/>  | <input checked="" type="checkbox"/>                                    | Past Performance   |                      |
| Not required<br>as part of<br>official RFP   | Not required<br>as part of<br>official RFP                          | <input type="checkbox"/>   | Quality Assurance/Quality Control  |                      |
| <input type="checkbox"/>   | <input type="checkbox"/>  | <input checked="" type="checkbox"/>                                    | Location. The percentage of work performed in Michigan will be used on all contracts unless the contract is for on-site inspection, then location should be scored for the on-site inspection. |                      |
| N/A  | N/A   | <input type="checkbox"/>   | Presentation   |                      |
| N/A  | N/A   | <input type="checkbox"/>   | Technical Proposal (if Presentation is required)   |                      |
| 3 pages (MDOT forms not counted)<br><b>(No Resumes)</b>  | 7 pages (MDOT forms not counted)                                    | 19 pages (MDOT forms not counted)                                      | Total maximum pages for RFP <b>not including key personnel resumes</b>   |                      |

# REQUEST FOR PROPOSAL

The Michigan Department of Transportation (MDOT) is seeking professional services for the project contained in the attached scope of services.

If your firm is interested in providing services, please indicate your interest by submitting a Proposal, Proposal/Bid Sheet or Bid Sheet as indicated below. The documents must be submitted in accordance with the latest "Consultant/Vendor Selection Guidelines for Service Contracts" and "Guideline for Completing a Low Bid Sheet(s)", if a low bid is involved as part of the selection process. **Referenced Guidelines are available on MDOT's website under Doing Business > Requests for Proposals.**

## RFP SPECIFIC INFORMATION

☒ BUREAU OF HIGHWAYS ☐ BUREAU OF TRANSPORTATION PLANNING \*\* ☐ OTHER

THE SERVICE WAS POSTED ON THE ANTICIPATED QUARTERLY REQUESTS FOR PROPOSALS

☒ NO ☐ YES DATED \_\_\_\_\_ THROUGH \_\_\_\_\_

|  |   |
|--|---|
| <input type="checkbox"/> <b>Prequalified Services</b> – See page ____ of the attached Scope of Services for required Prequalification Classifications. | <input checked="" type="checkbox"/> <b>Non-Prequalified Services</b> - If selected, the vendor must make sure that current financial information, including labor rates, overhead computations, and financial statements, if overhead is not audited, is on file with MDOT's Office of Commission Audits. This information must be on file for the prime vendor and all sub vendors so that the contract will not be delayed. |
|--|---|

☒ **Qualifications Based Selection** – Use Consultant/Vendor Selection Guidelines

**For all Qualifications Based Selections**, the selection team will review the information submitted and will select the firm considered most qualified to perform the services based on the proposals. The selected vendor will be contacted to confirm capacity. Upon confirmation, that firm will be asked to prepare a priced proposal. Negotiations will be conducted with the firm selected.

**\*\* For RFP's that originate in Bureau of Transportation Planning only**, a price proposal must be submitted at the same time as, but separate from, the proposal. Submit directly to the Contract Administrator/Selection Specialist, Bureau of Transportation Planning (**see address list, page 2**). The price proposal must be submitted in a sealed manila envelope, clearly marked in large red letters **"PRICE PROPOSAL – TO BE OPENED ONLY BY SELECTION SPECIALIST."** The vendor's name and return address **MUST** be on the front of the envelope. The price proposal will only be opened for the highest scoring proposal. Unopened price proposals will be returned to the unselected vendor(s). Failure to comply with this procedure may result in your bid being opened erroneously by the mail room.

**For a cost plus fixed fee contract**, the selected vendor must have a cost accounting system to support a cost plus fixed fee contract. This type of system has a job-order cost accounting system for the recording and accumulation of costs incurred under its contracts. Each project is assigned a job number so that costs may be segregated and accumulated in the vendor's job-order accounting system.

☐ **Qualifications Review / Low Bid** - Use Consultant/Vendor Selection Guidelines. See Bid Sheet Instructions for additional information.

For Qualification Review/Low Bid selections, the selection team will review the proposals submitted and post the date of the bid opening on the MDOT website. The notification will be posted at least two business days prior to the bid opening. Only bids from vendors that meet proposal requirements will be opened. The vendor with the lowest bid will be selected. The selected vendor may be contacted to confirm capacity.

☐ **Best Value** - Use Consultant/Vendor Selection Guidelines. See Bid Sheet Instructions below for additional information. The bid amount is a component of the total proposal score, not the determining factor of the selection.

☐ **Low Bid** (no qualifications review required - no proposal required.) See Bid Sheet Instructions below for additional instructions.

## BID SHEET INSTRUCTIONS

A bid sheet(s) must be submitted in accordance with the "Guideline for Completing a Low Bid Sheet(s)" (available on MDOT's website). The Bid Sheet is located at the end of the Scope of Services. Submit bid sheet(s) separate from the proposal, to the address indicated below. The bid sheet(s) must be submitted in a sealed manila envelope, clearly marked in large red letters **"SEALED BID – TO BE OPENED ONLY BY SELECTION SPECIALIST."** The vendor's name and return address **MUST** be on the front of the envelope. Failure to comply with this procedure may result in your bid being opened erroneously by the mail room.

**PROPOSAL SUBMITTAL INFORMATION**

|  |                              |                       |
|--|------------------------------|-----------------------|
| REQUIRED NUMBER OF COPIES FOR PROJECT MANAGER<br>3 | PROPOSAL DUE DATE<br>2/22/07 | TIME DUE<br>3:00 p.m. |
|--|------------------------------|-----------------------|

**PROPOSAL AND BID SHEET MAILING ADDRESSES**

Mail the multiple proposal bundle to the MDOT Project Manager or Other indicated below.

☒ MDOT Project Manager ☐ MDOT Other

Daniel Belcher, P.E., P.S.  
P.O. Box 30050  
Lansing MI 48909  
belcherd@michigan.gov

Mail one additional stapled copy of the proposal to the Lansing Office indicated below.

| Lansing Regular Mail   | OR | Lansing Overnight Mail   |
|--|----|--|
| <input checked="" type="checkbox"/> Secretary, Contract Services Div - B225<br>Michigan Department of Transportation<br>PO Box 30050<br>Lansing, MI 48909                                    |    | Secretary, Contract Services Div - B225<br>Michigan Department of Transportation<br>425 W. Ottawa<br>Lansing, MI 48933   |
| <input type="checkbox"/> Contract Administrator/Selection Specialist<br>Bureau of Transportation Planning B340<br>Michigan Department of Transportation<br>PO Box 30050<br>Lansing, MI 48909 |    | Contract Administrator/Selection Specialist<br>Bureau of Transportation Planning B340<br>Michigan Department of Transportation<br>425 W. Ottawa<br>Lansing, MI 48933 |

**GENERAL INFORMATION**

Any questions relative to the scope of services must be submitted by e-mail to the MDOT Project Manager. Questions must be received by the Project Manager at least four (4) working days prior to the due date and time specified above. All questions and answers will be placed on the MDOT website as soon as possible after receipt of the questions, and at least three (3) days prior to the RFP due date deadline. The names of vendors submitting questions will not be disclosed.

MDOT is an equal opportunity employer and MDOT DBE firms are encouraged to apply. The participating DBE firm, as currently certified by MDOT's Office of Equal Opportunity, shall be listed in the Proposal

**MDOT FORMS REQUIRED AS PART OF PROPOSAL SUBMISSION**

- 5100D** – Request for Proposal Cover Sheet
- 5100G** – Certification of Availability of Key Personnel

(These forms are not included in the proposal maximum page count.)

**Michigan Department of Transportation**

**SCOPE OF SERVICE  
FOR  
DESIGN SERVICES  
MACHINE ASSISTED CONSTRUCTION OF HIGHWAYS 1 (MACH1)**

**CONTROL SECTION:** NA

**JOB NUMBER:** NA

**LOCATION:** NA

**ANTICIPATED PROJECT START DATE:** March 2007

**ANTICIPATED PROJECT COMPLETION DATE:** March 2010

**DESCRIPTION OF WORK:**

**GEOPAK Criteria Configuration:** The Consultant shall provide services to assist the Michigan Department of Transportation (hereto referred to as the Department) with the configuration of Michigan's GEOPAK Criteria files to produce 3-dimensional terrain models for construction projects. The first priority shall be to configure selected portions of the Criteria to create 3 dimensional digital terrain models for the MACH1 pilot project. In addition Michigan's Criteria will be re-configured to more efficiently design roads to the Department's design standards.

**Bentley Onsite (formerly CEI Toolset):** The Consultant shall provide assistance to the Department in the use of Bentley's newly developed Onsite software for construction stakeout and inspection. The Consultant will provide assistance in creation of the design archive for the MACH1 pilot project.

**Training:** The Consultant will perform training to allow the Department's staff to perform these activities in the future. The Department's GEOPAK/CAD support staff will be given the training necessary to create 3 dimensional digital terrain models and design archives in sufficient detail to allow them to train others in the future. The Department's Construction staff will be sufficiently trained to perform stakeout and inspection duties using Bentley's Onsite software. In addition provide an on-site GEOPAK drainage class for up to 10 students.

**Support:** The Consultant shall provide as needed support during construction of the selected pilot project in the event that difficulties arise or the proposed design requires modification to DTMs or quantities due to changes in the field.

**FieldManager:** The Consultant will work with InfoTech to develop an interface between Bentley Onsite and FieldManager. This will be an import/export interface that can be run as needed in the field.

## **MACH1 PILOT PROJECT BACKGROUND:**

The Department has selected a project located in Mt. Pleasant, Michigan for the MACH1 Pilot of machine controlled grading and Bentley Onsite software. This project is located on US-127 Business Route south of town. The proposed design is to construct a modified boulevard section partially using the existing two lane section in preparation for the extension and intersection of a county road. The project length is approximately 0.6 of a mile. The current letting date for the project is February 2, 2007 with an estimated construction start date after Memorial Day with completion by the middle of August.

## **SCHEDULE:**

The Consultant will propose a timeline for activities listed in the “Project Deliverables” section. The timeline shall list the individual tasks/steps that are planned to complete each item along with the planned start date, end date and hours estimated to complete each activity.

## **PROJECT DELIVERABLES:**

- A. **Pilot Project Terrain Model:** Configure GEOPAK criteria to create the necessary terrain models for the Department’s MACH1 pilot project. Models will be created for clay, gravel, sand and pavement layers. Median cross over areas shall at a minimum be included in the clay layer. Clean up of the Department’s final design may be necessary in order to properly model these surfaces. The Consultant will be responsible for generation of and quality control of the terrain models. Final terrain models must be completed by the date requested by the contractor that is awarded the job.
- B. **Pilot Project Design Archive:** Assist the Department in creation of the design archive for the MACH1 pilot project. The Department believes that GEOPAK Quantity Manager and GEOPAK Drainage will be properly set up for the project. The Department has limited experience in both these areas so assistance may be required in troubleshooting and correction of the information. The Consultant will provide the quality control necessary to ensure that the design archive is satisfactory for use in Bentley Onsite software and appropriate for field stakeout and inspection activities.
- C. **FieldManager Integration:** Integration between Bentley Onsite and AASHTO FieldManager (developed by InfoTech) is highly desirable to the Department. Since the Department is a co-owner of FieldManager this is an excellent opportunity to develop this software interface. The goal is to have a beta version of the interface to test during the MACH1 project. Success of the MACH1 pilot is not dependent on this integration but the Consultant must be committed to working with the Department and InfoTech to develop the connection. Any delays that can be attributed to the Consultant will be unsatisfactory.

An import/export interface is acceptable for the pilot. The capability to perform the import/export as needed throughout a day is desired. The Beta interface should be ready for training and testing prior to the start of project construction which is scheduled for the

end of May. The intent is to meet the needs of the user with the Beta version of the software but there is an understanding that the interface may evolve during the pilot to better reflect business needs.

- D. **GEOPAK Drainage Training:** Provide an on-site generic GEOPAK drainage class to a maximum of 10 students. If possible incorporate the Department's drainage library in the hands on activities. The class will be held in the Design Training Room in the Van Wagoner building situated in Lansing, MI.
- E. **Design Training:** The Consultant shall provide training to the Department's GEOPAK and CAD support for up to 20 students. This training will be sufficient to enable support staff to create Digital Terrain Models (DTMs), design archives and to train others in the future. Adequate training documentation will be provided in electronic format, for unlimited use by the Department, which specifies the steps necessary to create the DTMs and design archives.
- F. **Construction Training:** The Consultant shall provide classroom and on-site training to the Department's construction staff in the use and administration of Bentley Onsite for up to 20 students. Sufficient training documentation will be provided in electronic format, for unlimited use by the Department, which provides detailed instruction on usage and administration of the Bentley Onsite software. This will include assistance with set up of Onsite Client software and tablet PC software. On the job training shall be provided during initial stakeout and inspection of the MACH1 pilot project.
- G. **Support:** The Consultant shall provide as-needed technical and on-site support during the construction phase of the MACH1 pilot project. Support requests shall be made directly to Consultant staff that is assigned to this project. A maximum turn around time of one business day is expected on support of Bentley Onsite usage. Periodic quality assurance shall be performed on inspection data to ensure field procedures are generating proper information. Assistance may be required to modify proposed DTMs or quantities if changes are necessary during construction. Bentley will provide the necessary support to ensure changes to the proposed DTMs be completed within 3 business days. Support will be available during normal business hours from Monday through Friday.
- H. **GEOPAK Criteria Modifications:** The Contractor shall configuration Michigan's GEOPAK Criteria files to improve efficiency in designing roads to the Department's standards. The list of requested re-configurations is attached in Appendix A. It is the Consultant's responsibility to thoroughly understand each item listed prior to making modifications. In addition all Criteria will be modified to include the ability to create DTMs for roadway layers. The Criteria files shall include sufficient documentation that allows the Department's GEOPAK support staff to understand the functionality of the individual Criteria components. The proposed cost for each phase listed in Appendix A shall be listed individually as stand alone entities in case they need to be removed from the contract.

#### **CONSULTANT RESPONSIBILITIES:**

1. Provide a central contact for all project activities.

2. Provide engineering and Bentley software expertise necessary to successfully complete the tasks identified for this project in a timely manner.
3. Perform site visits as necessary to provide training and support for the project.
4. Provide quality control for all deliverables including DTMs, Design Archive information and field inspection data.
5. The Consultant shall furnish all services and labor necessary to conduct and complete the services described herein. The Consultant shall also furnish all materials, equipment, supplies, and incidentals necessary to perform the Services (other than those designated in writing to be furnished by the Department), and check and/or test the materials, equipment, supplies, and incidentals as necessary in carrying out this work. The Services shall be performed to the satisfaction of the Department consistent with applicable professional standards.
6. The Services described herein are financed with public funds. The Consultant shall comply with all applicable Federal and State laws, rules, and regulations. The Consultant shall perform field operations in accordance with MIOSHA regulations and accepted safety practices. The consultant staff shall conduct themselves with professionalism in carrying out their duties.
7. Individuals proposed for this project shall be committed for the full duration of the contract. They should have extensive and demonstrated experience as indicated. Individuals proposed for the work must be the actual individuals that will perform the work.
8. The Consultant will notify the Project Manager, in writing, prior to any personnel changes from those specified in the Consultant's original approved proposal. Any personnel substitutions are subject to review and approval of the Project Manager.
9. At the request of the Department, the Consultant, during the progress of the Services, shall furnish information or data relating to the Services described herein that may be required by the Department to enable it to carry out or to proceed with related phases of the Project not described herein, or which may be necessary to enable the Department to furnish information to the Consultant upon which to proceed with further Services.
10. The Consultant agrees to demonstrate knowledge and performance in compliance with the standard design and construction practices of the Department, the project specific design, the Standard Specifications for Construction and applicable publications referenced within the Road Design Manual, the AASHTO green book, and any other references, guidelines, procedures and manuals needed to carry out the work described herein in an appropriate manner.

**CONSULTANT RESOURCES:**

Resumes for Consultant staff shall be provided with the proposal. A minimum of two resources shall be provided for this project. Each individual proposed must meet one of the following requirements (exception: the Consultant staff assigned to create the FieldManger interface does not need to meet these requirements):

**Licensed Engineer**

Licensed as a professional engineer.

Minimum of 5 years DOT road design experience.

Minimum of 3 years in DOT GEOPAK Criteria development.

Minimum of 2 years in creating DTMs for DOT projects.

Minimum of 3 years experience in training others to use software.

**Licensed Surveyor**

Licensed as a professions surveryor.

Minumum of 5 years DOT road construction stakeout and inspection experience.

Working knowledge of GPS equipment and usage.

Minumum of 2 years experience in using Bentley Onsite software.

Minimum of 3 years experience in training others to use software/hardware.

Prior approval by the Project Manager is required to substitute individuals that are not identified in the Consultant's proposal.

**MDOT RESPONSIBILITIES:**

- A. The Department will provide all CAD and GEOPAK files that were created for the MACH1 Pilot project.
- B. The Department will create the GEOPAK Drainage and Quantity Manager information for the MACH1 Pilot project.
- C. The Department will provide all hardware necessary for this project.
- D. The Department will provide the necessary internal resources to accomplish all phases of this project.
- E. The Department will work closely with InfoTech to enable creation of an interface between Bentley Onsite and AASHTO FieldManager.

**MDOT KEY CONTACT RESOURCES:**

The following will be the key resources that will be involved with this project. The Consultant may contact and work with these individuals as long as the Project Manager is aware of the activity.

**Project Manager:** Daniel J. Belcher, P.E., P.S.  
425 W. Ottawa St.  
Lansing, MI 48909



Belcherd@mi.gov  
(517) 335-2182

**GEOPAK Team Leader:** David Geyer, P.E.  
425 W. Ottawa St.  
Lansing, MI 48909  
Geyerdave@mi.gov  
(517) 335-2441

**FieldManager Support:** Cliff Farr, P.E.  
8885 Ricks Rd.  
Lansing, MI 48909  
[Farre@mi.gov](mailto:Farre@mi.gov)  
(517) 322-6039

**Survey/CORS Support:** Andy Semenchuk, P.S.  
425 W. Ottawa St.  
Lansing, MI 48909  
Semenchuka@mi.gov  
(517) 335-1923

#### **MDOT PILOT PROJECT CONTACTS:**

##### **MT. PLEASANT TRANSPORTATION SERVICE CENTER (TSC):**

**Delivery Engineer** William Mayhew, P.E.  
1212 Corporate Drive  
Mt. Pleasant, MI 48858  
[mayhewb@mi.gov](mailto:mayhewb@mi.gov)  
(989) 775-6104 ext 303

**Development Engineer** Jack Hofweber, P.E.  
1212 Corporate Drive  
Mt. Pleasant, MI 48858  
hofweberj@mi.gov  
(989) 775-6104 ext 302

#### **CONSULTANT PAYMENT:**

All invoices/bills for services must be directed to the Department's Project Manager. Payment to the consultant will be based on time and materials. The loaded hourly rate for assigned staff will be indicated in the Consultant's proposal. The Contract will be established with a not to exceed maximum amount. This amount can not be exceeded unless an increase is approved by the Department. All invoices/bills must be submitted within 14 calendar days of the last date of services being performed for that invoice.

Invoices will be submitted bi-weekly. The invoice will indicate the Consultant staff charging time to the project, dates worked, and number of hours, hourly rate, total bi-weekly amount per resource and accumulated dollar amount for the project. A description of work completed during the two week period will accompany the invoice. This report shall include any problems encountered and actions taken to solve the issue. A brief description of activities planned for the next invoice period shall also be included. Any changes to the approved schedule will be indicated. The proposed format of this report shall be submitted with the Consultant's proposal for approval by the Project Manager.

The only hours that will be considered allowable charges for this contract are those that are directly attributable to the activities of this Project. Hours spent in administrative, clerical, or accounting roles for billing and support, are not considered allowable hours; there will be no reimbursement for these hours. There will be no reimbursement for hours at an overtime rate unless the Department has directed the Consultant to work additional hours in excess of 40 hours per person per week.

Direct expenses shall be estimated in the Consultant's proposal. Direct expenses will not be paid in excess of that allowed by the Department's own employees in accordance with the State of Michigan's Standardized Travel Regulations. Supporting documentation must be submitted, with the invoice/bill, for all individual billable expenses in excess of \$100 and all hotel accommodations regardless of the dollar amount.

## **Appendix A**

### **Reconfiguration of Michigan's GEOPAK Criteria for the Michigan Department of Transportation**

#### **Phase 1: MACH1**

Start Date: March 7, 2007  
Duration: 2 months  
Completion Date: May 7, 2007

Reconfiguration of Michigan GEOPAK Criteria for use with Roadway Modeler on machine control project (stripped down undivided roadway only). 3D model of pavement layers must be completed by start of training classes for the MACH1 project.

#### **Phase 2: New Development**

Start Date: October 1, 2007  
Duration: 9 months  
Completion Date: June 30, 2008

Perform a total re-configuration of the Michigan Criteria, including support for Roadway Modeler, adhoc attributes, and HTML documentation. Also include the following capabilities, in addition to those already available within MDOT's existing Criteria.

#### **Project Scoping / Kickoff Meeting**

A kickoff meeting will be held in early October to fully define the capabilities for the Criteria, VBA applications, etc. and will run for 3 full days.

Provide suggestions for incorporation of additional capabilities not included within this document.

Provide sample plans (electronic files) from the 5 most progressive DOT's using GEOPAK, showing their approach to cross sections, typelines, super elevation diagrams, and typicals.

#### **Existing Typical**

Add the ability to draw existing agg shoulder and back & bottom of existing curb & gutter.

#### **Rehab Typical**

Add ability to use a leveling & base course in a widening section and a top course over the entire roadway.

Rename reconstruction typical to rehab.

Rename Match Existing typical to Mill & Fill.

Rename Mill & Fill option under OverlayType to Crown Correction / Widening.

Rename Crack Relief option under OverlayType (added by D. Kent) to Unbonded Concrete Overlay (HMA Separator Layer special provision) and resolve need to set 3<sup>rd</sup> pavement layer to a thickness other than zero, etc.

### **New Typical**

Rename the new typical to new/recon.

### **Paved Shoulders**

Add the ability to reconstruct only the shoulders & overlay the rest.

Add the ability to mill a paved shoulder.

Increase number of proposed paved shoulder layers from 2 to 3.

Rename the `_d_PavedShoulderThickness` and `_d_PavedShoulderBaseThickness` redefinable variables to `Layer1` & `Layer2` (similar to `Pavement`) to avoid confusion with the agg base, which extends under the shoulders.

### **Agg Shoulders**

Add the ability to independently control drawing of 1' agg shoulder extensions on left, right, & median shoulders.

### **Superelevation Shoulder Rollover**

Obtain pavement slope information needed to calculate shoulder slopes using VBA rather than superelevation shape input files.

### **Curb & Gutter**

Add ability to draw a top of curb profile with the curb depressed at driveways.

Add the ability to draw sand under the curb & gutter and stop agg base at face of gutter pan.

### **Ramps**

Add new capabilities to automate ramp design.

Add paved gore resolve capabilities & upgrade grass gore resolve capabilities.

### **Slopes**

Add ability to draw a proposed topsoil layer, in order to improve accuracy of earthwork quantities.

Add fill slope table to control fill slope based on fill height (like IGRDS), based on Section 2.03.01 of Road Design Manual.

Add the ability to draw retaining walls according to MDOT design methods, which will require input from MDOT's geotechnical group.

Add the ability to draw single face barrier walls on outside shoulders.

Rename `ForceClosingSlopes` redefinable variables & tie line to `ForceDitchOff` or `DitchOff`.

Rename turf buffer to curb buffer.

Rename green space buffer to agg shoulder buffer.

### **Drainage**

Add the ability to create more than one independent ditch alignment.

Add the ability to draw underdrains, driveway culverts, median culverts, and cross culverts in cross sections.

Rename `Special Ditch` redefinable variable to `Independent Ditch`.

### **Median**

Add ability to move the valley gutter away from the median barrier wall.

Allow use of a 1' agg shoulder extension, greenspace buffer, turf buffer, etc. in the median of a divided highway.

## **Driveways**

Revise how driveways are drawn into cross sections for earthwork calculations.

## **Future Lane Widening**

Add the ability to treat a future lane widening as a paved or agg shoulder, with full depth subbase and base on either the median side or outside shoulder.

Add the ability to draw green space buffer (agg shoulder buffer) in median to accommodate future lane widening.

## **Cross Section Labeling**

Add additional labeling detail to cross sections to make them an acceptable deliverable to construction, in place of typicals, typelines, & superelevation diagrams.

Label entire subgrade (clay grade) slope, include grade breaks in superelevation sections.

Add additional text labels to cross sections, to allow extraction of profile data, etc. from any point on the cross sections.

## **Criteria Files**

Set up the \$(GPK\_ACBOOK\_DDBFILE) path setting in variables.x.

Link topsoil symbology in variables.x to D&C Manager.

Remove all hard coded level references from exsubbase.x & exsidewalk.x and move to variables.x, with link to D&C Manager.

## **Consultant Requests**

2. Create unique marked points (x y or \_mp\_) at critical points for customization.
5. Shape Input Files - check to make sure in correct cluster, not just offset when doing shoulder slopes.
6. Cold-Milling Typical - want different pavement depths for mill/fill area than widening section
8. Cold-Milling Typical - use a variable for milling depth and then add the pavement layer depths (not the shape).
9. Ret Walls - have more options. 1) draw to graphical element and then up/down to exist gr. 2) Back in the ret wall from ROW.
10. Check for LT or RT with Cogo offsets, not just px1 < px2. Cases (loop ramp) where stationing goes backwards.
13. D&C Elements - XS use the Scan Lines but there are also QTY items. These should only but in D&C once (QTY).
15. Add option to add Ad-Hocs for chain name for elements. These could be used in \_mp\_ names and to break out qty's.
17. Concrete Median Barrier - when there is an elevation difference between roads, the barrier widens at the bottom (the top does now) and a shoulder shortens up. Flag
19. Ditch Alignment - change so that stationing does not have to match cluster baseline stationing.
24. Have variable to turn on/off for extend existing ground.
25. Option or 3pc to draw in CB's and Storm Sewer - (future when using Geopak Drainage or use Ad-hocs for info).

### **VBA Application Upgrades**

Provide the following 3PC applications & macro interfaces in VBA:

PI Labels – The macro interface created by Bruce Sherer, needs testing with ProjectWise & shared gpk file on server.

Ground Points

Type Line Diagram (Profile Sheet)

Superelevation Diagram (Profile Sheet)

TOC Labels

### **VBA Applications**

#### **Superelevation Labeling Tool (Plan View)**

Use VBA to scan superelevation shapes and perform the following:

- Provide pavement slope information at cross section locations, for use in calculating shoulder slopes using criteria.
- Label superelevation transition point stations, pavement slopes, & shoulder slopes in plan view.
- Include divided & undivided roadway options.
- Create superelevation transition summary table.

#### **Slope Labeling Tool (Plan View)**

Use VBA to scan plan view elements or a slope input file and perform the following:

- Label fill / ditch slopes & ditch widths in plan view.
- Include divided & undivided roadway options.
- Create fill slope, ditch slope, & ditch width summary table.

#### **Title Block Management Tool**

Provide a VBA tool that interfaces MicroStation with Excel, to manage sheet title block information. The application must be able to run both inside and outside ProjectWise.

### **Final Delivery Meeting / Training**

Following completion of the Criteria Library, VBA applications, & documentation, provide two full days of training to MDOT's CAD support group in the use of these applications.

### **Warranty**

Provide bug fixes for 6 months following completion of Phase 2.

### **Phase 3: Maintenance Agreement**

Start Date: January 1, 2009

Duration: 15 months

Completion Date: Contract end date

Upon completion of the Criteria warranty period provide up to 125 hours for configuration of Criteria files to add new capabilities and address fixes.

### **Phase 4: Training Manual**

Start Date: July 1, 2008

Duration: 3 months

Completion Date: September 30, 2008

Prepare an advanced training manual based on the new Michigan Criteria configuration, Geopak 8.9 (XM), and ProjectWise. The manual will be created by updating and expanding the existing MDOT training manual in its current format (MS Word with extensive screen captures). MDOT will be responsible for preparing customized resource files meeting MDOT standards where needed. Deliverables will include:

- Draft versions of training manual (MS Word & PDF) & data sets (.zip), to be used in two training classes by MDOT to identify typos, etc.
- Final versions of training manual (MS Word & PDF) & data sets (.zip).